

***Multimodal Pain Management:***  
Reduction of Opioid Use in Surgery

## Profile

**Intermountain Healthcare** is an internationally recognized, integrated, not-for-profit health system based in Salt Lake City, Utah, (USA) with 33 Hospitals, (includes „virtual“ hospital), 385 Ambulatory Care Centers (clinics), approximately 3,900 employed physicians and advanced practice providers, and a health insurance company, Select Health, which covers more than 1.2 million lives. Intermountain is widely recognized as one of the premier healthcare systems in the United States and as a leader in transforming healthcare through high-quality clinical outcomes and efficient healthcare delivery at a sustainable cost.

Intermountain is the largest healthcare provider in the Intermountain West with more than 60,000 caregivers (employees) serve communities in seven US primary states: *Utah, Idaho, Nevada, Colorado, Wyoming, Montana, and Kansas*, and also regularly treat patients from other parts of the Intermountain West. In addition to the services and care it offers in its physical facilities, Intermountain Healthcare also provides extensive telehealth services with over 35 telehealth programs in the western United States, further enhancing Intermountain Healthcare's ability to provide quality-based medical care to patients across its vast geography. Intermountain has been delivering on its mission of helping people live the healthiest lives possible.

Intermountain Healthcare is the **first healthcare system in the world** to earn “**Triple Stage 7 Organization**” status by adding HIMSS' new EMRAM22 **Aspirational Maturity Model Standard** requirements to their O-EMRAM and AMAM Stage 7 achievements, for care facilities located in Utah & Idaho.

Intermountain's quest for better health and high-quality care at more affordable costs is the driving force behind Intermountain's commitment to truly transform healthcare across the country. Intermountain Healthcare is uniquely positioned in the nation to provide technological advancements and innovative solutions that help meet the demand for high quality care at a sustainable cost with a long history of excellence in healthcare technology & innovation, development and to find solutions that help patients and those who provide care and to improve care and outcomes for patients.

**Date Stage 7 was achieved: March 1, 2021**

## The Challenge

In this case study addressing opioid use during the perioperative and home settings, Intermountain Healthcare recognized a significant problem within our communities. With surgery being among the top indications for opioid initiation and 6% of opioid naïve patients developing dependence and the disease of addiction, a culture shift with changes to clinical practice are needed.

In response Intermountain Healthcare began a process of introducing clinical and system driven data into opioid sparing techniques to impact clinical practice. With modifications to the electronic health care record (EHR) to support these initiatives, all combined into a change of practice resulting into changes and culture to the approach of pain management.

Our clinical leaders educated providers on the risk associated with opioids and developed opioid free and/or reduced opioid use in the intraoperative space. To meet this challenge, goals were set to increase the use of multimodal pain modalities, decrease in-hospital morphine milligram equivalents required for pain management, reduce pain scores and to reduce the number of opioid prescription tablets prescribed postoperatively.

## Implementation Overview

The scope of this work was to capture the entire patient experience, preoperative, intraoperative, home, by introducing opioid sparing modalities in the workflows. With the opioid crisis underway we began looking at strategies to reduce home opioid prescriptions. The first milestone was Intermountain Healthcare's recognition for the need of actual patient data to determine the role for perioperative opioid use. To capture both electronic and paper prescriptions written, a patient survey was developed to determine the opioid prescribed, quantity, dose, frequency, tablets consumed, and the patient's opioid exposure preoperatively. With this data Intermountain Healthcare developed an app called Opioid Rx for 'Data on the Go' which allows providers to filter procedure specific opioid recommendations by surgical specialty, +/- procedure group, and procedure to see surgery specific opioid requirements for both opioid naïve and exposed patients. The Opioid RX app data was then built into the EHR by with procedure specific prescriptions and incorporated into surgeon clinic and discharge workflows.

Intermountain Healthcare leadership began an initiative for opioid free surgery in qualifying populations and perioperative opioid sparing modalities to change the culture and our approach to pain management. With these initiatives in place clinical changes to practices were made using data driven metrics, supported by an opioid sparing data reporting tool developed in the process, which showed which interventions used system wide led to the best outcomes. Modifications were made to the EHR targeting the providers role in pain

management during the various phases of care. In the EHR, we introduced multimodal pain medications into the surgeon preoperative order sets and eliminated the use of preoperative opioids as appropriate. An opioid sparing macro was developed in the anesthesia module, used as order sets during the intraoperative space, to guide providers in using non-opioid medications. Low-dose ketamine and lidocaine infusion order sets were introduced into the EHR to be used with appropriate procedures and/or patient populations. Multimodal medications were imbedded into PACU orders sets and scheduled in the postoperative plans to continue the use of these opioid sparing modalities into the floor and home, capturing the entire patients surgical experience. In addition to multimodal medications being added to our surgeons postoperative order sets, we also grouped opioids together based on the MME/Dose, with preferred opioid available in the form of range doses which encourage provider MME/Dose awareness and encouraging use of acetaminophen free opioids to prevent exceeding acetaminophen daily dose limits.

For implementation, anesthesia leadership lead changes to clinical practice with system data from the opioid sparing reporting. Surgical leadership from the various surgical practices were socialized to the recommendations for scheduled non opioid alternatives and were engaged in the decisions around medications used. Surgical specialties were implemented system wide into the EHR in a phased approach. In some cases, to support the transition in resaving order sets rules were developed directed providers to resave new postoperative plans as favorites over a 30-day period. Prescriptions built into the EHR were also rolled out by specialty groups to adequacy support adoption. Repeated messaging and education were both critical for success.

**Key Participants Involved in the Process:** Will Shakespeare MD, Nathan Richards MD, Reed Nelson MD, Farukh Usmani, MD, Kristi Van Damn RN, Jennifer Wall RN, Ryan Cardon, PharmD.

## Resulting Value / ROI

Acetaminophen, ibuprofen, and ketorolac nursing assessments and documentation were excluded from nursing workflows preventing 114,000 medications assessments yearly and a productivity time savings of 9,500 hours. Total investment of \$1,856.27 resulted in productivity savings of \$550,188.23 with a first-year return of investment of 29539.45% and a 5-year net present value of \$2,320,268.

MME/HR measured between 2018-2019 show surgical patients needing 1.825 MME/HR (43.8 MME/day) CI (1.907, 1.743) compared to 2021 1.582 MME/HR (37.9 MME/day) indicating a 13.3% MME/HR reduction ( $P < 0.001$ ). Pain score max/day measured between 2018-2019 resulted in a value of 3.59 CI (3.597, 3.582) compared to 2021 with a value 3.461: CI (3.472, 3.450) indicating a 3.59% reduction in max pain scores ( $P < 0.001$ ). Length of stay (LOS) measured between 2018-2019 showed a LOS of 21.63 hours CI (25.44, 17.92) compared to 2021 LOS of 16.46 hours CI (16.68, 16.33), resulting in a \*23.9% reduction in LOS ( $P < 0.001$ ). \*Covid-19 led to quicker discharges to free hospital beds.

Opioid prescriptions totaled 4,077,096 in 2017, 3,975,334 in 2018 with a year over year (YOY) decrease of -2.5%, 3,243,447 in 2019 with a YOY decrease of -18.41%, 2,433,371 in 2020 with a YOY decrease of -24.98%, and 2,293,358 in 2021 with a YOY decrease of -5.75%, with a total of a 43.75% reduction in opioid prescriptions from 2017 - 2021. The quantity of tablets prescribed/prescription decreased from 23.09 in 2017, to 17.17 in 2018 with a YOY decrease of -25.59%, 13.65 in 2019 with a YOY decrease of -20.57%, 12.24 in 2020 with a YOY decrease of -10.3%, and 9.96 in 2021 YOY decrease of 18.24% with a total reduction in opioid tablets prescribed/prescription of 56.865 between 2017 – 2021. Patient reporting of “How well pain was address” through Press Ganey (PG) showed Intermountain Healthcare all PG data base rank improving from 48 in 2017 (N, 8950, to an all PG data base rank of 70 in 2021 (N,6945)

These data show that a safer approach to pain management supported with technology can lead to decreased opioid exposure with improved pain control, decreased LOS, and reduced opioid prescriptions with patients in the perioperative space.

## Lessons Learned

System data supporting the clinical application of opioid sparing modalities can drive significant outcomes in our patients.

Provider adoptions and patient outcomes can be impacted by thoughtful approaches to content creation and design of the EHR.

A multidisciplinary approach including clinical content, EHR design, education, and adoption support area all critical to implementation of an opioid sparing alternative to pain management.



***Technology-enabled solutions are combating the Opioid Crisis with data and with decision support. Physicians want to do the right thing and they embrace the concept as soon as we show them that opioid-sparing care is superior care: the pain scores, the rescue medication requirements, the nausea rates, the duration of stay all improve. This data persuades the decision-makers that their own patients thrive with opioid-sparing care. The integration of multimodal medications into a physician's order set works as "power steering" to make it effortless to do the right thing. This opioid-sparing care rings true for the integrity of Intermountain in providing care that minimizes the risk of persistent opioid dependence and care that keeps opioids out of the community.***

– Will Shakespeare, M.D. Medical Director Senior-Surgical Operations

**Technology can be used to incorporate data into provider workflows to reduce opioid exposure, pain scores, length of stay, and opioid prescription quantities with superior perioperative pain management.**

**For questions, contact:**

**Farukh Usmani, MD**

Medical Director Care Transformation

Intermountain Healthcare

Email: [Farukh.Usmani@imail.org](mailto:Farukh.Usmani@imail.org)



Intermountain Healthcare is a team of nearly 60,000 caregivers who serve the healthcare needs of people across the Intermountain West, primarily in Utah, Idaho, Nevada, Colorado, Montana, Wyoming, and Kansas. We are an integrated, non-profit health system based in Salt Lake City, with clinics, a medical group, affiliate networks, hospitals, homecare, telehealth, health insurance plans, and other services, along with wholly owned subsidiaries including SelectHealth, Saltzer Health, Castell, Tellica, and Classic Air Medical.

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